

CLAIMS

- 1 1. A computerized data file system, comprising:
2 a first process that maintains a data file in computer-readable memory; and
3 a second process that generates a first message requesting that said second process
4 be granted by said first process a plurality of tokens required for said second process to
5 modify at least one characteristic of said file;
6 said first process generating a second message, in response to said first message,
7 that grants said tokens to said first process if said tokens are available for grant to said
8 second process.

- 1 2. A system according to claim 1, wherein:
2 said first process is resident at a server computer node, and said second process is
3 resident at a client computer node.

- 1 3. A system according to claim 1, wherein:
2 if any of said tokens are unavailable for grant to said second process as a result of
3 current grant of said tokens to at least one other process, said first process generates a
4 third message revoking the current grant of said tokens to said at least one other process.

- 1 4. A system according to claim 3, wherein:
2 said at least one other process, in response to said third message, generates a
3 fourth message making said tokens available for grant by said first process.

- 1 5. A system according to claim 3, wherein:
2 said first process resides in a first computer node;
3 said second process resides in a second computer node;
4 said at least one other process resides in at least one other computer node; and
5 said first computer, second computer, and at least one other computer nodes are
6 networked together and are remote from each other.

- 1 6. A computer node, comprising:
2 a first process residing in said node that generates a first message that grants a set
3 of tokens, if the set of tokens is available for grant, to a second process that requested
4 grant of the set of tokens, the set of tokens being required for the second process to be
5 able to modify at least one characteristic of a file stored in computer-readable memory.
- 1 7. A node according to claim 6, wherein:
2 each of the processes resides in a respective one of the computer nodes.
- 1 8. A node according to claim 7, wherein:
2 one of the processes resides in a server computer node and the other of the proc-
3 esses resides in a client computer node.
- 1 9. A node according to claim 6, wherein:
2 if at least one token in the set of tokens is unavailable for grant because the at
3 least one token is currently granted to a third process, the first process also generates a
4 second message that revokes current grant of the at least one token to the third process
5 prior to generating the first message.
- 1 10. A node according to claim 6, wherein:
2 the first message is generated by the first process in response to a request for the
3 grant of the set of tokens generated by the second process, the request specifying all to-
4 kens required for the second process to be able to modify the at least one characteristic of
5 the file.
- 1 11. A computer node, comprising:
2 a first process residing in said node that generates a request to a second process
3 for grant of a set of tokens required to enable the first process to modify at least one char-
4 acteristic of a file residing in computer-readable memory.
- 1 12. A node according to claim 11, wherein:

2 the second process resides in a second computer node, and the memory is com-
3 prised in said second node.

1 13. A node according to claim 11, wherein:
2 the set of tokens comprises all tokens required for the first process to be able to
3 modify the at least one characteristic of the file.

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1 14. A network computer system, comprising:
2 a first computer node having a data file in computer-readable memory; and
3 a second computer node that issues to the first computer node a first message re-
4 questing grant of a set of tokens required to carry out a modification of at least one char-
5 acteristic of said file;
6 the first computer node issuing a second message to the second computer node
7 after receipt of the first message, the second message granting the set of tokens to the first
8 process if the set of tokens is available for grant to the second process.

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1 14. A system according to claim 13, wherein:
2 the first computer node is a server node, and the second computer node is a non-
3 server node.

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1 15. A system according to claim 13, wherein:
2 the set of tokens comprises all tokens required to carry out the modification of the
3 at least one characteristic of the file.

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1 16. A system according to claim 13, wherein:
2 if at least one token in the set of tokens is unavailable for the grant because the at
3 least one token is currently granted, the first computer node waits to issue the first mes-
4 sage until after the first computer node receives a third message from a third computer
5 node indicating relinquishment of current grant of the at least one token.

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1 17. A system according to claim 16, wherein:

the at least one token comprises a plurality of tokens.

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18. Computer-readable memory containing computer-executable program instructions, the instructions comprising:

first instructions which when executed permit a data file to be maintained in computer storage memory;

second instructions which when executed generate a first message requesting grant of a plurality of tokens required to modify at least one characteristic of said file; and

third instructions which when executed generate a second message, in response to said first message, that grants said tokens if said tokens are available for grant to said second process.

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19. Computer-readable memory containing computer-executable program instructions, the instructions comprising:

first instructions which when executed generate a first message that grants a set of tokens, if the set of tokens is available for grant, to a requester of the set of tokens, the set of tokens being required to permit the requester to be able to modify at least one characteristic of a file stored in computer storage memory.

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20. Computer-readable memory containing computer-executable program instructions, the instructions comprising:

first instructions that when executed generate a request for grant of a set of tokens required to enable modification by an issuer of the request of at least one characteristic of a file residing in storage memory.

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21. Computer-readable memory according to Claim 18, further comprising:

further instructions which when executed causes, if any of said tokens are unavailable for grant as a result of current grant of said tokens, generation of a third message revoking the current grant of said tokens.

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22. A system according to claim 21, wherein:

2 said further instructions, in response to said third message, generate a fourth mes-
3 sage making said tokens available for grant.

1 ²⁴23. Computer-readable memory according to claim 19, further comprising:
2 further instructions which when executed cause, if at least one token in the set of
3 tokens is unavailable for grant because the at least one token is currently granted, genera-
4 tion of a second message that revokes previous grant of the at least one token prior to
5 generating the first message.

1 ²⁵24. Computer-readable memory according to claim 19, wherein:
2 the first message is generated in response to a request for the grant of the set of
3 tokens generated, the request specifying all tokens required to be able to modify the at
4 least one characteristic of the file.

1 ²⁶25. Computer-readable memory according to claim 20, wherein:
2 the set of tokens comprises all tokens required to be able to modify the at least
3 one characteristic of the file.

1 ²⁷26. A computerized data file system, comprising:
2 means for maintaining a data file in computer-readable memory; and
3 means for generating a first message requesting grant of a plurality of tokens re-
4 quired to modify at least one characteristic of said file;
5 means for generating a second message, in response to said first message, that
6 grants said tokens if said tokens are available for grant.

1 ²⁸27. A system according to claim 26, further comprising:
2 means for generating, if any of said tokens are unavailable for grant as a result of
3 current grant of said tokens, a third message revoking the current grant of said tokens.

1 ²⁹28. A system according to claim 27, further comprising:

means for generating, in response to said third message, a fourth message making said tokens available for grant.

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29. A computerized method for coherently maintaining and modifying a data file, comprising:
maintaining a data file in computer-readable memory;
generating a first message requesting grant of a plurality of tokens required to modify at least one characteristic of said file; and
generating a second message, in response to said first message, that grants said tokens if said tokens are available for grant.

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30. A method according to claim 29, further comprising:
if any of said tokens are unavailable for grant as a result of current grant of said tokens to at least one other process, generating a third message revoking the grant of said tokens.

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31. A method according to claim 30, wherein:
in response to said third message, a fourth message making said tokens available for grant is generated.

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32. A computerized method for use in maintaining coherency of a data file, comprising:
generating a first message that grants a set of tokens, if the set of tokens is available for grant, to a requester of the grant of the set of tokens, the set of tokens being required for requester to be able to modify at least one characteristic of the file.

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33. A method according to claim 32, wherein:
if at least one token in the set of tokens is unavailable for grant because the at least one token has been currently granted, the method also comprises a second message that revokes current grant of the at least one token prior to generating the first message.

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1 A method according to claim 32, wherein:
2 the first message is generated in response to a request for the grant of the set of
3 tokens generated by the requester, the request specifying all tokens required for the re-
4 quester to be able to modify the at least one characteristic of the file.

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35.

1 A computerized method for use in maintaining coherency of a data file, compris-
2 ing:
3 generating a request for grant of a set of tokens required to enable modification of
4 at least one characteristic of the file.

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1 A method according to claim 35, wherein:
2 the set of tokens comprises all tokens required to be able to modify the at least
3 one characteristic of the file.